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The Goblin Spider Genus *Aprusia* Simon, 1893 (Araneae: Oonopidae)

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ABSTRACT

The south Asian goblin spider genus *Aprusia* Simon (Araneae: Oonopidae) consists of five species and is found in southwestern India and Sri Lanka. Although the type species *A. strenuus* Simon is known only from two juvenile syntypes, new topotypical material from Sri Lanka allowed a redefinition of the genus and species. *Ischnothyreus vestigator* Simon, also from Sri Lanka, is transferred to *Aprusia* based on recently collected topotypical specimens. The female is described for the first time. Three new species are described: *A. veddah* Grismado and Deeleman, *A. kataragama* Grismado and Deeleman (both from Sri Lanka), and *A. kerala* Grismado and Deeleman (from southwestern India). The genus is recognized by the relatively small to medium-sized dorsal scutum on the abdomen of both sexes, the strong macrosetae on the forelegs and by the conformation of the male palp, with the cymbium and bulb fused and a tiny, slightly sclerotized embolus.

INTRODUCTION

The Oonopidae (goblin spiders) is a large family (543 named species in 74 genera; Platnick, 2010) of very small, six-eyed, haplogyne spiders, which are most abundant and diverse in the tropics. Most species are leaf-litter dwellers, but others occur in a wide range of habitats, in

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bird or rodent nests, under rocks, tree foliage, and even in human buildings (e.g., Fannes and Jocqué, 2008; Ubick, 2005; Platnick and Dupérré, 2009c; Korenko et al., 2009).

Because of their small size and cryptic habits, oonopids have long been neglected and hence understudied (Ubick, 2005). Recently, the Goblin Spider PBI project (www.research.amnh.org/oonopidae) contributed papers on taxonomy (e.g., Platnick and Dupérré, 2009a, 2009b, 2009c; Baehr et al., 2010), fine anatomy and reproductive behavior (e.g., Burger 2009, 2010; Burger et al., 2010), and ecology (Fannes et al., 2008), increasing our knowledge of this family.

Since its creation by Simon in 1893, *Aprusia* has remained monotypic and no additional species has been included in the genus. The examination of the type material from Nuwara Eliya, Sri Lanka (figs. 1–5) shows two juvenile specimens, here considered as syntypes. Nevertheless, despite being juvenile, the eye arrangement and the leg spination seem to be good characters to separate this genus from most of the other goblin spider genera. Another genus known in Sri Lanka to which these types could be assigned is *Ischnothyreus* Simon, but the cephalic part of the carapace, in dorsal view, is slightly elongated and more abruptly narrowed in *A. strenuus* than in *Ischnothyreus* species (see, for example, Edward and Harvey, 2009). Additionally, the genus *Ischnothyreus* has much stronger sclerotized scutae, differing clearly from the type of *A. strenuus*. Nevertheless, juveniles of the loricate oonopids can usually lack these scutae, resembling soft-bodied oonopids. Simon (1893a) in his key to oonopids, remarked that *Aprusia* is very similar to *Ischnothyreus*, differing only in lacking the abdominal scutae (therefore, he listed *Aprusia* in the "molles" and *Ischnothyreus* among the "loricati").

One of us (C.D.) collected in Sri Lanka (in 1981) a few additional specimens (belonging to three species) that resemble *A. strenuus*, especially the general morphology of the carapace, the eye arrangement, and the strong spines on the forelegs. The adult specimens have abdominal scutae, very similar to those known in *Ischnothyreus*, although less sclerotized. They also show important differences in the genitalia, especially the male palps, which are pale, with the bulb fused to the cymbium, and a tiny, only slightly sclerotized embolus (figs. 20, 43, 53–55). All these features are very different from the highly modified palp of the *Ischnothyreus* species, which are darkly pigmented, strongly sclerotized, curved outward, and with the bulb and cymbium not completely fused (see, for example, Edward and Harvey, 2009: figs. 5–7). The females also lack the distinct, sinuous duct visible through the cuticle in the females of *Ischnothyreus* (Edward and Harvey, 2009: fig. 10), but have a strongly procurved anterior margin of the postepigastric scutum in the epigynal area (figs. 19, 35, 42).

Apart from *Ischnothyreus*, the other genus that shows some similarity with *Aprusia* is *Camptoscaphiella* Caporiacco. While males of that genus are easily recognized by the enormously enlarged patella of the palp (Baehr and Ubick, 2010), the general morphology of females is similar to those of *Aprusia* and *Ischnothyreus*. However, *Camptoscaphiella* females have a posteriorly directed copulatory duct, whereas those of *Aprusia* have a receptaculum directed anteriorly. In addition, in *Camptoscaphiella* and *Ischnothyreus*, the copulatory orifice opens on the postepigastric plate, while in *Aprusia*, the opening is inconspicuous, located presumably in the epigastric furrow.

Among the material collected in Kandy, Sri Lanka, a species was found that fits almost exactly with Simon's description of *Ischnothyreus vestigator* whose type locality is Kandy. Simon (1893a) included this species in that loricate genus by the presence of abdominal scuta, but the genital morphology of both sexes look like that of other undescribed taxa found in Sri Lanka that we consider congeneric with *A. strenuus*. Thus, we propose to transfer this species to the genus *Aprusia*.

Finally, among the material of other collections we found one additional species from Kerala, southwest India, extending the known geographic range of the genus to outside Sri Lanka.

Specimens are deposited in the following collections: Nationaal Natuurhistorisch Museum, Leiden (RMNH, Jeremy Miller), Museum d'histoire naturelle de la Ville de Geneve (MHNG, Peter Schwendinger), and Muséum National d'Histoire Naturelle, Paris (MNHN, Christine Rollard). The descriptions were generated automatically from the Species Descriptive Database of the oonopid Planetary Biodiversity Inventory project. Female genitalia were observed in clove oil. Drawings were made with a camera lucida mounted on an Olympus BH-2 compound microscope. Photographs of the preserved specimens were taken with a Leica DFC 290 digital camera mounted on a Leica M165 C stereoscopic microscope, and the focal planes were aligned with Helicon Focus 4.62.2. All measurements are in millimeters. Due to the scarcity of museum specimens, we avoided the use of irreversible techniques—such as scanning electron microscope—in fully documenting the anatomy of the animals (possible only for some leg characters). We provide approximate coordinates (denoted by "ca.") calculated with Google Earth (http://earth.google.com) from label data. For taxonomic purposes, Grismado and Deeleman are responsible for the new taxa.

TAXONOMY

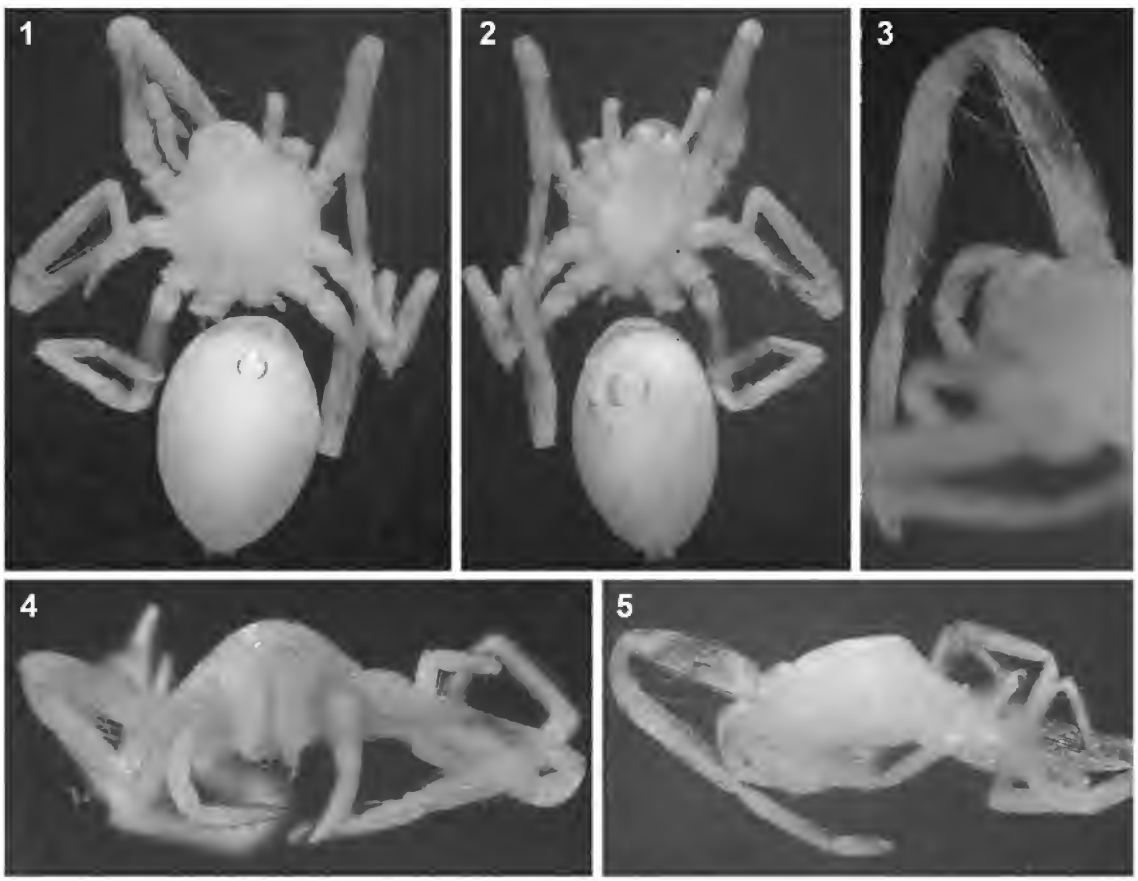
Aprusia Simon, 1893

Aprusia Simon, 1893a: 295, (type species, by monotypy *Aprusia strenuus* Simon).

Diagnosis: *Aprusia* resembles *Ischnothyreus* and *Camptoscaphiella* in the eye arrangement, the shape of the abdominal scutum and the strong spination on legs I and II, but differs in the morphology of the copulatory organs; the male palpi of *Aprusia* are pale, with the bulb ovoid to fusiform, completely fused to the cymbium, and with a short apical embolus, slightly sclerotized, sometimes accompanied by a tiny conductor. Females usually differ by the more elongated carapace and narrow pars cephalica at the ocular area, and by the strongly procurved anterior margin of the postepigastric scutum, on which there is no visible copulatory opening (situated presumably in the epigastric furrow). The internal genitalia lack the backward-directed, more or less strongly sinuous duct typical of *Ischnothyreus* and *Camptoscaphiella*. The abdominal scuta in both sexes are less heavily sclerotized than in those two genera.

Description: **Male**: CEPHALOTHORAX: Carapace pale orange, without any pattern, broadly oval in dorsal view, anteriorly narrowed to 0.49 × its maximum width or less, with

rounded posterolateral corners, posterolateral edge without pits, posterior margin not bulging below posterior rim, anterolateral corners without extension or projections, posterolateral surface without spikes, surface of elevated portion of pars cephalica smooth, thorax without depressions, fovea absent, without radiating rows of pits; lateral margin straight, smooth, without denticles; plumose setae near posterior margin of pars thoracica absent; nonmarginal pars cephalica setae light, needlelike; marginal setae absent. Clypeus margin unmodified, vertical in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent. Chilum absent. Six eyes, well developed, all subequal; posterior eye row procurved from front, straight or procurved from above; ALE-PLE separated by less than ALE radius, PME touching throughout most of their length. Sternum pale orange, uniform, not fused to carapace, median concavity absent, without radial furrows between coxae I–II, II–III, III–IV. Surface smooth, without pits, microsculpture absent, sickle-shaped structures absent, anterior margin unmodified, anterior corner unmodified, distance between coxae approximately equal, extensions of precoxal triangles present, lateral margins with narrow extensions between coxae, without posterior hump; sternum posterior margin not extending posteriorly of coxae IV, lateral margin without infracoxal grooves; setae sparse, light, needlelike, evenly scattered, originating from surface, without hair tufts. Mouthparts: Chelicerae, endites, and labium pale orange. Chelicerae straight, anterior face unmodified; without teeth on both promargin and retromargin; without toothlike projections, directed posteriorly, shape normal, without prominent basal process, tip unmodified; setae needlelike, evenly scattered; paturon inner margin with pairs of enlarged setae, distal region unmodified, posterior surface unmodified, promargin unmodified, inner margin unmodified. Labium not fused to sternum, quadrangular, broader than long, with anterior margin indented at middle, same as sternum in sclerotization; subdistal portion with unmodified setae. Endites distally not excavated, anteromedian tip unmodified, posteromedian part unmodified, same as sternum in sclerotization. ABDOMEN: Ovoid, without long posterior extension, rounded posteriorly; dorsum soft portions without color pattern. Book lung covers large, elliptical, without setae, anterolateral edge unmodified. Posterior spiracles not connected by groove. Pedicel tube short, unmodified, scuto-pedicel region unmodified, scutum extending far dorsal of pedicel, plumose hairs absent, matted setae on anterior ventral abdomen in pedicel area absent, cuticular outgrowths near pedicel absent. Dorsal scutum weakly sclerotized, pale orange, without color pattern, more than ½ to most of abdomen width, middle surface smooth, sides smooth, anterior half without projecting denticles. Epigastric scutum weakly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent. Postepigastric scutum weakly sclerotized, pale orange, covering about ½ of abdominal length, fused to epigastric scutum, anterior margin unmodified, without posteriorly directed lateral apodemes. Spinneret scutum absent. Supraanal scutum absent. Dorsum setae present, light, needlelike. Epigastric area setae uniform, light, needlelike. Postepigastric area setae present, light, needlelike. Dense patch of setae anterior to spinnerets absent. Interscutal membrane with setae. Colulus represented only by setae. LEGS: Without color pattern; femur IV not thickened, same size as femora I–III, patella plus tibia I near as long as carapace, tibia I unmodified, tibia IV specialized hairs on ventral apex absent, tibia IV ventral scopula absent, metatarsi I and II



FIGS. 1–5. *Aprusia strenuus* Simon, immature syntype (PBI_OON 06256). **1,** habitus dorsal; **2,** same, ventral; **3,** right leg I, prolateral; **4,** carapace, anterior; **5,** same, lateral. Total length of the specimen = 1.89.

mesoapical comb absent, metatarsi III and IV weak ventral scopula absent. Leg spines present. Tarsi I–IV without inferior claw, tarsi III and IV with a pair of clawlike setae (except in *A. kataragama*). GENITALIA: Epigastric region with sperm pore circular, unmodified; furrow without omega-shaped insertions. Palp normal size, lightly sclerotized, right and left palps symmetrical; embolus light, prolateral excavation absent; trochanter normal size, unmodified; femur normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, attaching to patella basally; patella shorter than femur, not enlarged, setae unmodified; tibia trichobothria not examined; cymbium pale white, completely fused with bulb, no seam visible; bulb white, 1.0 to 1.5 times as long as cymbium.

Female: As in male except as noted. CEPHALOTHORAX: Clypeus setae absent. Female palp tarsus unmodified. ABDOMEN: Epigastric scutum without lateral joints, dorsal scutum usually shorter than in males. Spinneret scutum with fringe of needlelike setae. GENITALIA: Anterior margin of postepigastric scutum with a procurved chitinized ridge. Field in front snow white, in the middle an anteriorly directed element (visible through cuticle only in *A. vestigator*) with variable length that is probably homologous to the anterior receptacle of other

dysderoids, with a thin lumen, a widened anterior tip, and two pairs of muscles, one forwardly directed and other posterolaterally directed, connecting with the lateral sclerotized endings of the procurved epigynal ridge. Laterally to this ridge, two posteriorly directed internal apodemes. The posterior part of the internal genitalia consists of a relatively large, slightly sclerotized posterior receptacle (at least in *A. vestigator*).

Relationships: In addition to the above similarities with *Ischnothyreus* and *Camptoscaphiella*, there is an additional character, present, to our knowledge, only in *Aprusia, Ischnothyreus*, and an undescribed new genus from Madagascar (D. Ubick, personal commun.): a pair of special setae with hooked and unbarbed tip (similar to claws) between the normal claws on the tarsi III and IV (figs. 56–66). This feature is absent in *A. kataragama* and also apparently in *Camposcaphiella*, although more studies are needed for a better understanding of the distribution of this striking (and potentially synapomorphic) character.

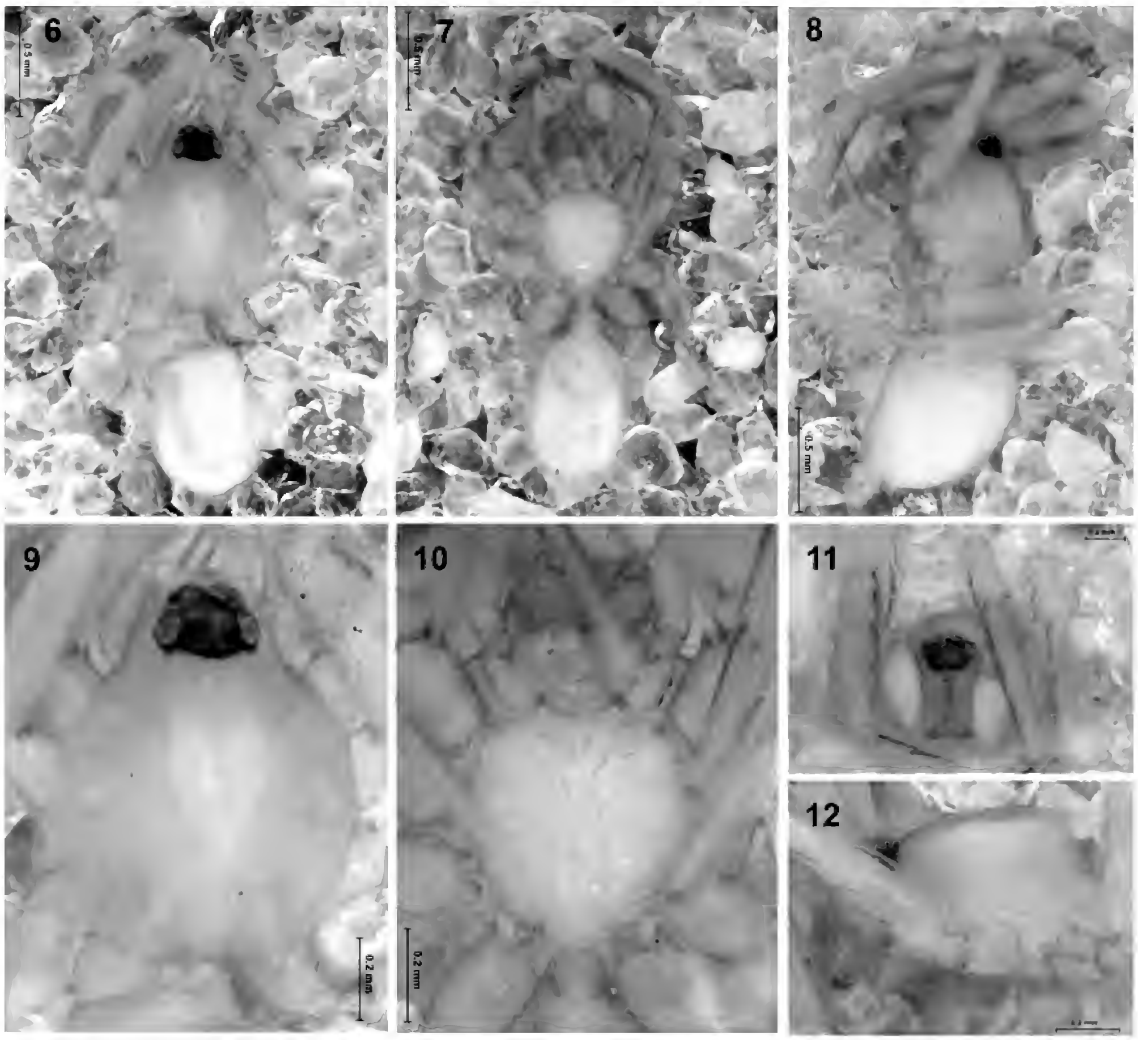
Distribution: *Aprusia* has been found in Sri Lanka and southern India. The known records of this genus seem to correspond to the Western Ghats–Sri Lanka hotspot of biodiversity, where it would be an endemic. However, the unity of the two components of that region (southwest of mainland India, on the one hand, and Sri Lanka, on the other) has recently been questioned (see, for example, Bossuyt et al., 2004; Gunawardene et al., 2007).

Aprusia strenuus Simon, 1893
Figures 1–5, 67

Aprusia strenuus Simon, 1893a: 295. Two immature syntypes specimens from Nuwara Eliya, Sri Lanka, ca. N 6°58′, E 80°47′ (deposited in MNHN 1502, examined).

Remarks: Because of the immature condition of the type species, we cannot dismiss the possibility that any of the three species from Sri Lanka described below might be conspecific with *A. strenuus*. However, we prefer to await the discovery of topotypical specimens (at high elevation, around 1800 m, at Nuwara Eliya) for a definitive conclusion (all other Sri Lankan species came from low altitudes, 600 m for Kandy or lower).

Description: Immature syntype (PBI_OON 6256). Total length 1.89. CEPHALOTHORAX: Carapace whitish, broadly oval in dorsal view (fig. 1), pars cephalica slightly elevated in lateral view (fig. 5), with angular posterolateral corners, sides smooth; nonmarginal pars cephalica setae lost; nonmarginal pars thoracica setae lost; marginal setae lost. Clypeus straight in front view (fig. 4), vertical in lateral view; setae lost. Eyes all subequal, all eyes oval; posterior eye row straight from front (fig. 4); ALE separated by their radius to diameter, ALE-PLE separated by less than ALE radius, PME touching, PLE-PME separated by less than PME radius. Sternum longer than wide, white, lateral margins unmodified. Mouthparts: Chelicerae, endites, and labium white. Chelicerae slightly divergent; promargin without teeth; setae lost. Labium setae lost. Endites serrula absent. ABDOMEN: Book lung covers elliptical. Dorsal scutum absent (fig. 1). Epigastric scutum absent. Postepigastric scutum absent. Abdomen setae lost. LEGS: Leg spination (only surfaces bearing spines listed, all spines longer than segment width): femora, I p0-0-2; tibiae, I p2-0-2; r2-0-2; II v3-0-3; metatarsi, I p1-0-1;



FIGS. 6–12. *Aprusia vestigator* (Simon), male (PBI_OON 15036). **6–8,** habitus (6, dorsal, 7, ventral, 8, lateral); **9–12,** cephalothorax (9, dorsal, 10, ventral, 11, anterior, 12, lateral).

r1-0-1; II v2-0-2 (fig. 3). Tarsi I–IV superior claws tooth not examined. Trichobothria not examined. GENITALIA: No genital structures visible.

MATERIAL EXAMINED: **SRI LANKA:** ***Central Province:*** Nuwara Eliya, 2 immatures syntypes (MNHN AR 1502, PBI_OON 6256).

Aprusia vestigator (Simon, 1893), new combination
Figures 6–21, 64–65, 67

Ischnothyreus vestigator Simon, 1893b: 302. Male holotype from Kandy, Sri Lanka, ca. N 7°15′, E 80°43′. Lost.

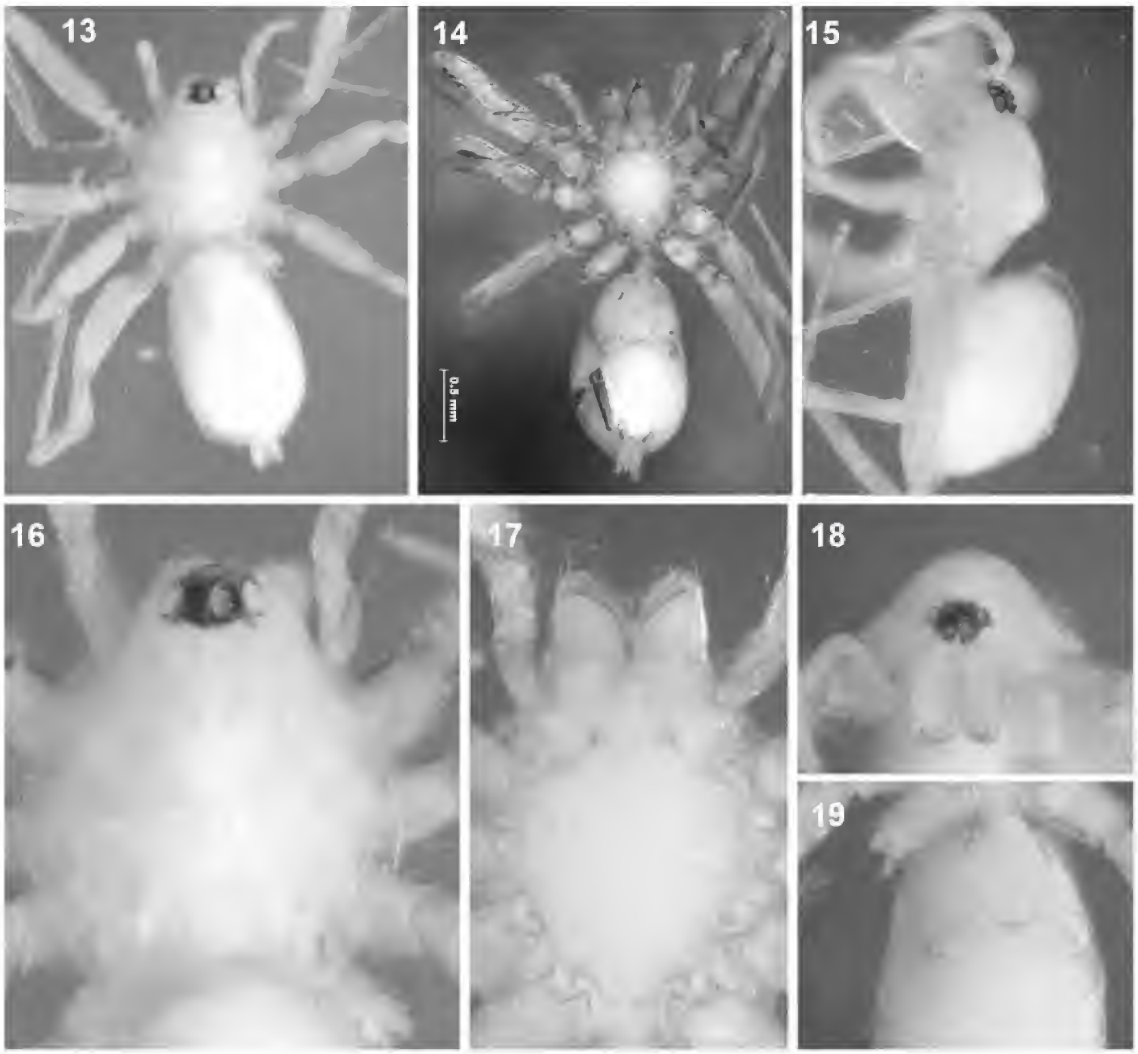


FIG. 13–19. *Aprusia vestigator* (Simon), female (PBI_OON 12914). **13–15,** habitus (13, dorsal, 14, ventral, 15, lateral); **16–18,** cephalothorax (16, dorsal, 17, ventral, 18, anterior); **19,** epigastric area, ventral.

Diagnosis: Males of *A. vestigator* differ from those of *A. kataragama* in having the relatively shorter copulatory bulb (fig. 20), and from those of *A. kerala* by their small size and by lacking the small conductor along the embolus (males of *A. veddah* are still unknown). Females can be recognized by the bracket-shaped sclerotized lines on both sides of the epigastric openings and by the longer anterior receptacle (figs. 19, 21). Both sexes have the sternum as long as wide (figs. 10, 17).

Description: **Male** (PBI_OON 15036). Total length 1.82. CEPHALOTHORAX: Carapace: Pars cephalica strongly elevated in lateral view (fig. 12), sides smooth; nonmarginal pars cephalica setae present, scattered; nonmarginal pars thoracica setae absent. Clypeus straight in

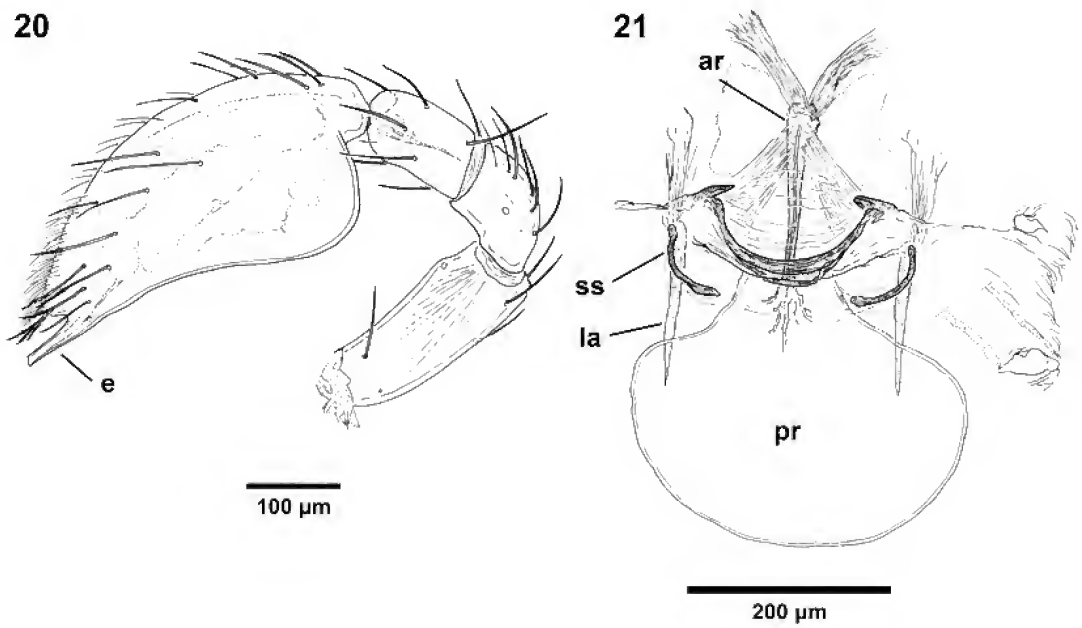


FIG. 20–21. *Aprusia vestigator* (Simon), genitalia. **20,** male (PBI_OON 15036), left palp, retrolateral; **21,** female (PBI_OON 12914), vulva, cleared, ventral. Abbreviations: ar = anterior receptaculum, e = embolus, la = lateral apodeme, pr = posterior receptaculum, ss = semicircular sclerotizations.

front view; setae absent (fig. 11). Eyes (figs. 9, 11): All eyes circular; posterior eye row procurved from above; ALE separated by less than their radius, PLE-PME touching. Sternum as long as wide. Mouthparts: Labium wide, with a broad anterior indentation; two subdistal normal setae. ABDOMEN: Dorsum soft portions pale white. Dorsal scutum covering ½ to ¾ of abdomen, not fused to epigastric scutum (fig. 6). Postepigastric scutum long, almost rectangular (fig. 7). LEGS: White. Leg spination (only surfaces bearing spines listed, all spines longer than segment width): leg I: femur, pv0-0-1-1-1-1; rv0-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg II: femur, pv0-0-0-1-1; rv1-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg III: tibia, v1ap; metatarsus, v1ap. Tarsi I–IV superior claws tooth not examined in detail. Trichobothria not examined. GENITALIA: Epigastric region with sperm pore small, situated at level of anterior spiracles. Palp proximal segments white; embolus small, nearly straight; cymbium with distal patch of setae; bulb stout, tapering apically, with a ventral concavity (fig. 20).

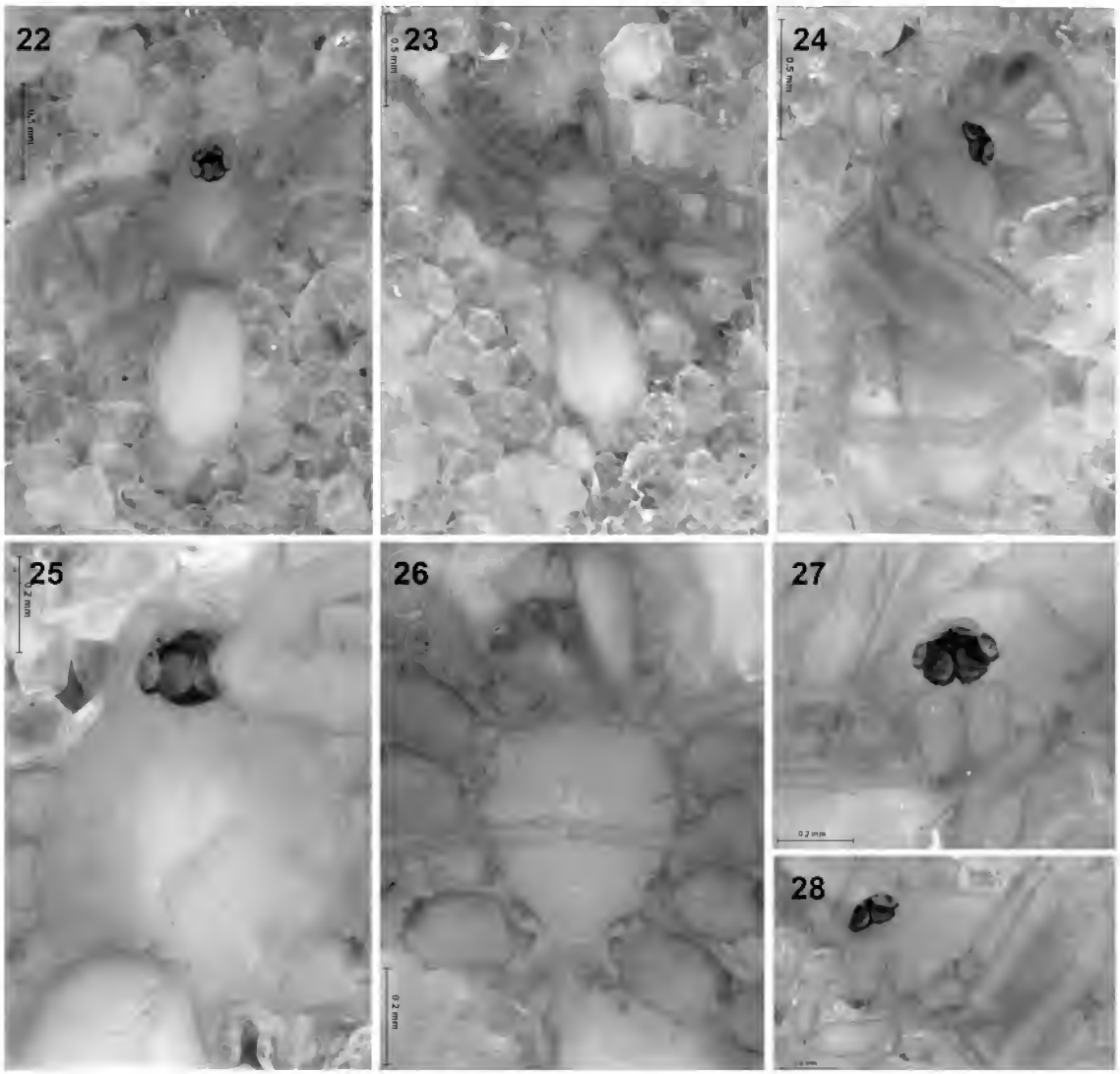
Female (PBI_OON 12914). Total length 2.20. CEPHALOTHORAX: Carapace yellow whitish, pyriform in dorsal view (fig. 13), pars cephalica slightly elevated in lateral view (fig. 15), with rounded posterolateral corners; lateral margin slightly undulate; nonmarginal pars cephalica setae present, scattered; nonmarginal pars thoracica setae light, needlelike; marginal setae light, needlelike. Clypeus straight in front view (fig. 18), sloping forward in lateral view. Eyes (figs. 16, 18) all subequal, all eyes circular; posterior eye row procurved from front; ALE touch-

ing, ALE-PLE touching, PME touching throughout most of their length, PLE-PME touching. Sternum as long as wide, white, lateral margins unmodified; setae abundant, dark, originating from small pits. Mouthparts: Chelicerae, endites, and labium white. Chelicerae straight; promargin with one tooth. Labium wide, with a procurved indentation. Endites: Serrula present in single row. Female palp: Claws absent; spines present; spines: patella, d0-1-0; p0-1-2; tibia, d2-0-1; p0-1-0; tarsus, v2-2-2. ABDOMEN: Book lung covers round. Posterior spiracles not connected by groove. Pedicel scutum not extending far dorsal of pedicel. Dorsal scutum weakly sclerotized, pale, without color pattern, covering about ½ of abdomen, more than ½ to most of abdomen width, not fused to epigastric scutum, middle surface smooth, sides smooth, anterior half without projecting denticles (figs. 13, 15). Epigastric scutum weakly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent. Postepigastric scutum weakly sclerotized, pale orange, widely hexagonal, only around epigastric furrow, not fused to epigastric scutum, anterior margin unmodified (fig. 19). Colulus present. LEGS: Patella plus tibia I longer than carapace. Leg spination (only surfaces bearing spines listed, all spines longer than segment width): leg I: femur, pv0-0-1-1-1-1; rv0-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg II: femur, pv0-0-1-1; rv0-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg III: patella, d2; tibia, dp1-1; dr1-1; v1-1ap; metatarsus, dp1-1; dr1; leg IV: patella, d2; tibia, d2-2; v1-1; metatarsus, p0-1; r0-1. Tarsi I–IV superior claws tooth not examined in detail. Trichobothria not examined. GENITALIA (figs. 19, 21): Ventral view: anterior margin of postepigastric scutum with a procurved chitinized ridge. Field in front snow white, with in the middle a very long straight anteriorly directed element, slightly longer than the spanning width of the arched ridge, extending underneath the epigastric scutum (visible by transparence). This element is probably homologous to the anterior receptacle of other dysderoids, it has a thin lumen, a widened anterior tip and two pairs of muscles, one directed forward and the other posterolaterally directed, connecting with the lateral sclerotized endings of the procurved epigynal ridge. Laterally to this ridge, bracket-shaped sclerotized lines, corresponding to the posteriorly directed internal apodemes. The posterior part of the internal genitalia consists of a relatively large, slightly sclerotized posterior receptacle.

Remarks: Although the male type specimen of *Ischnothyreus vestigator* is presumably lost (it could not be found in the MNHN), we attribute the specimens collected from the type locality to this species; in all major respects, they match Simon's (1893b) description. These specimens, however, do not match the genus *Ischnothyreus* by the bulb completely fused to the cymbium ("pedes maxillares palli luridi [...] tarso bulboque inter se coalitis..."; Simon, 1893b). We here transfer this species to *Aprusia*.

Although two species of *Aprusia* were collected at Kandy, we ascribe the larger specimens to *A. vestigator*, as the female is larger than the other species, *A. veddah*, and by the presence of four macrosetae on the prolateral side of the first femora ("femoribus anticis intus aculeis longis, 4..."; Simon, 1893b) rather three, as in *A. veddah*.

Material examined: **SRI LANKA:** ***Central Province:*** Kandy, ca. N 7°15′, E 80°43′, secondary forest, leaf litter, 600 m, 7–11 Aug. 1981, C.L. Deeleman and P.R. Deeleman, 1 ♀ (RMNH, PBI_OON 12914); same locality and collectors, Aug. 18, 1981, 1♂ (RMNH, PBI_



FIGS. 22–28. *Aprusia kataragama*, new species, male (paratype, PBI_OON 15034). **22–24,** habitus (22, dorsal, 23, ventral, 24, lateral); **25–28,** cephalothorax (25, dorsal, 26, ventral, 27, anterior, 28, lateral).

OON 12915). ***Sabaragamuwa Province:*** Ratnapura: Sinharaja, ca. N 6°24′, E 80°30′, 400 m, Aug. 20, 1981, C.L. Deeleman and P.R. Deeleman, 1 ♂ (RMNH PBI_OON 15036).

Aprusia kataragama Grismado and Deeleman, new species
Figures 22–35, 43–44, 62–63, 67

TYPE MATERIAL: Male holotype, two males and four female paratypes from Sri Lanka, Uva Province: Monaragala District: Kataragama Peak, ca. N 6°23′, E 81°20′, dry litter, 18 Aug. 1981, C.L. Deeleman and P.R. Deeleman (deposited in RMNH PBI_OON 15034).

ETYMOLOGY: The specific epithet is a noun in apposition taken from the type locality.

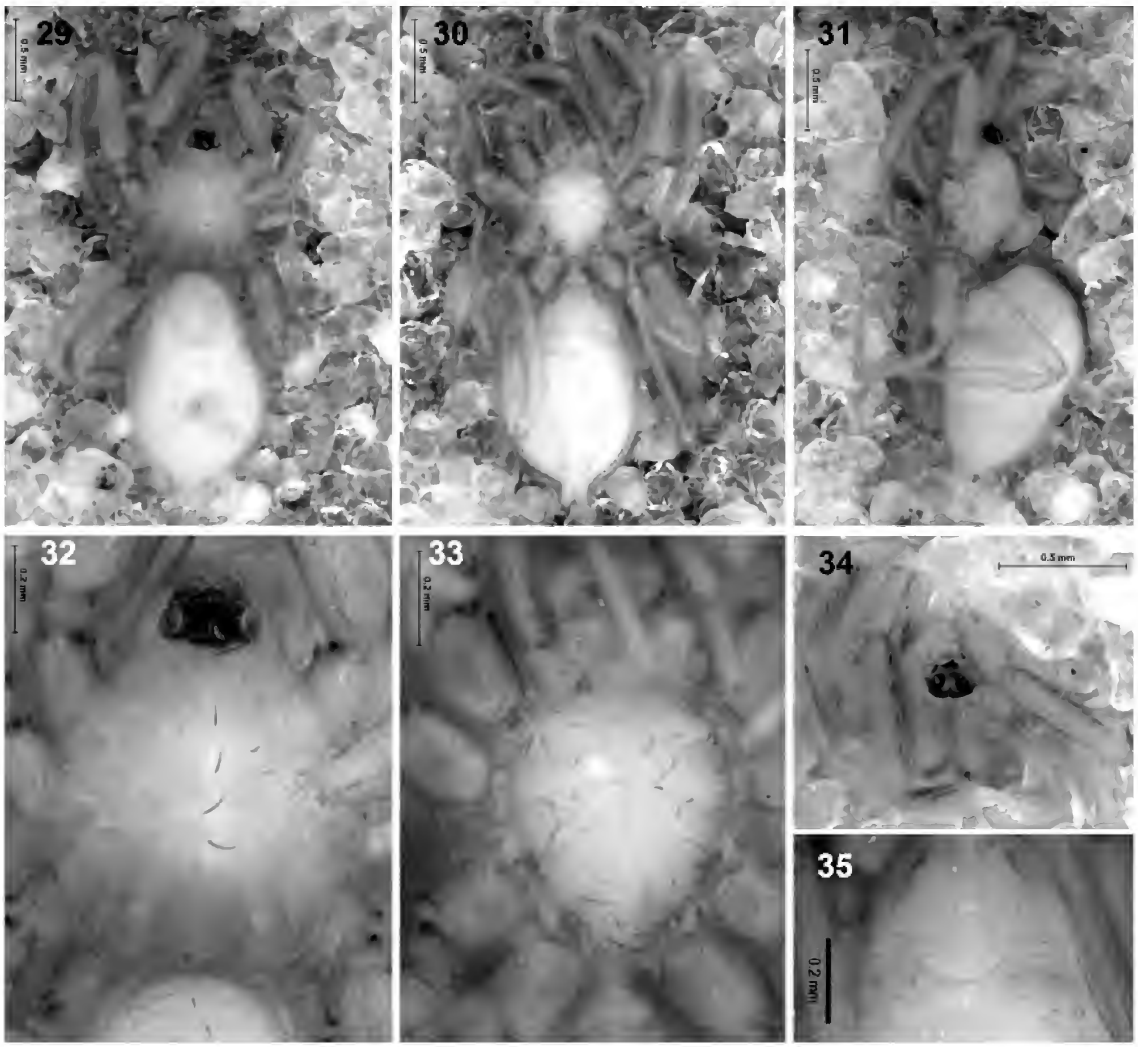


FIG. 29–35. *Aprusia kataragama*, new species, female paratype (PBI_OON 15034). **29–31,** habitus (29, dorsal, 30, ventral, 31, lateral); **32–34,** cephalothorax (32, dorsal, 33, ventral, 34, anterior); **35,** epigastric area, ventral.

Diagnosis: Males and females differ from *A. vestigator* by having the sternum longer than wide (figs. 26, 33) and by having three spines on the prolateral side of the first femora. Males also differ from those of *A. vestigator* and *A. kerala* by the very elongate, fusiform, copulatory bulb (fig. 43). Females are very similar to those of *A. veddah*, although the abdominal dorsal scutum is relatively short (fig. 29) and the anterior receptaculum and the lateral apodemes in the internal genitalia are also shorter (fig. 44). The procurved ridge of the postepigastric scutum is wider than in *A. veddah* and have a thinner margin (fig. 35). *A. kataragama* is the only species that lack the clawlike setae on the tarsi III and IV (figs. 62–63).

Description: **Male** (holotype). Total length 1.58. CEPHALOTHORAX: Carapace pars cephalica slightly elevated in lateral view (fig. 24), sides smooth; nonmarginal pars cephalica

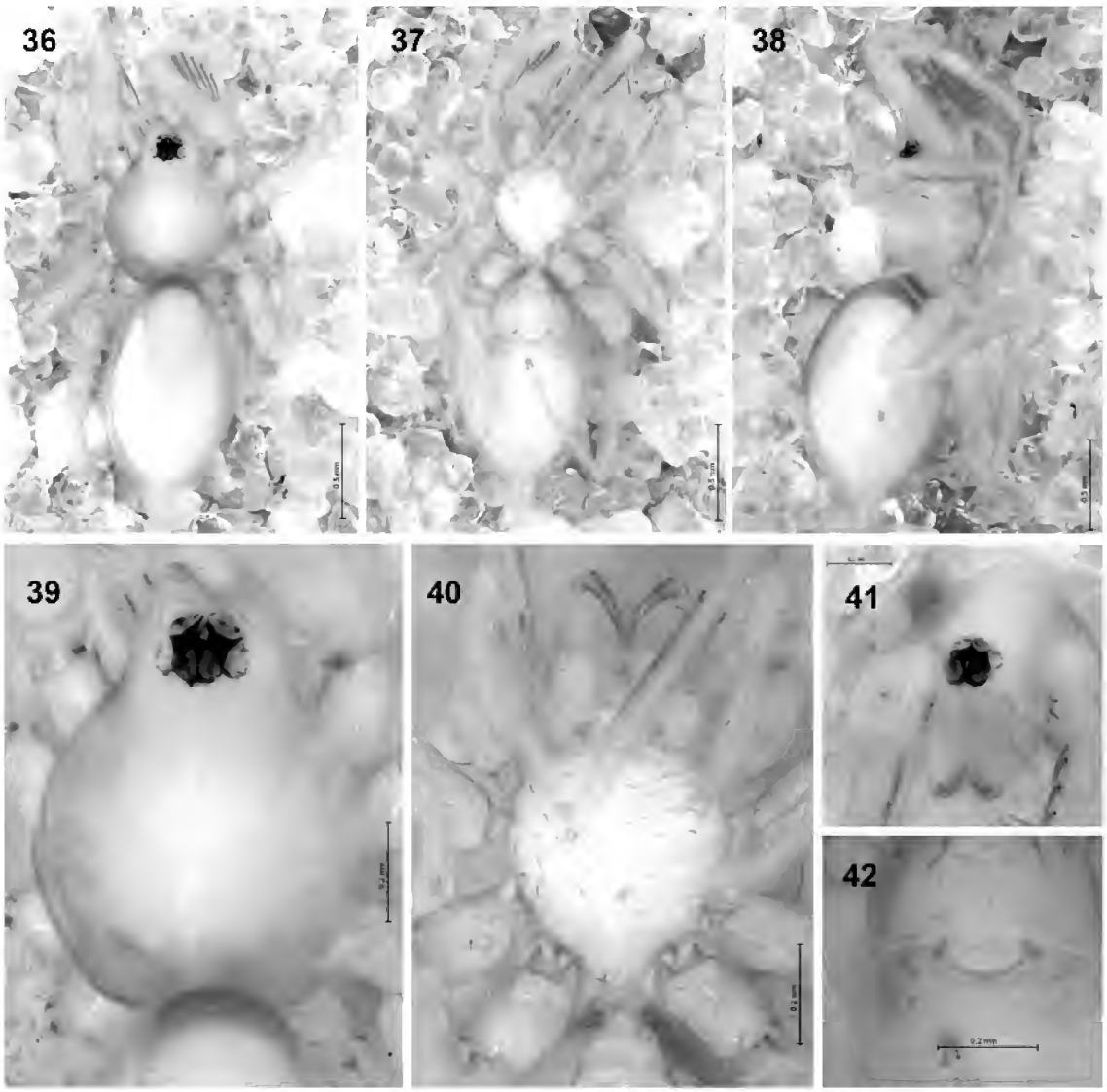
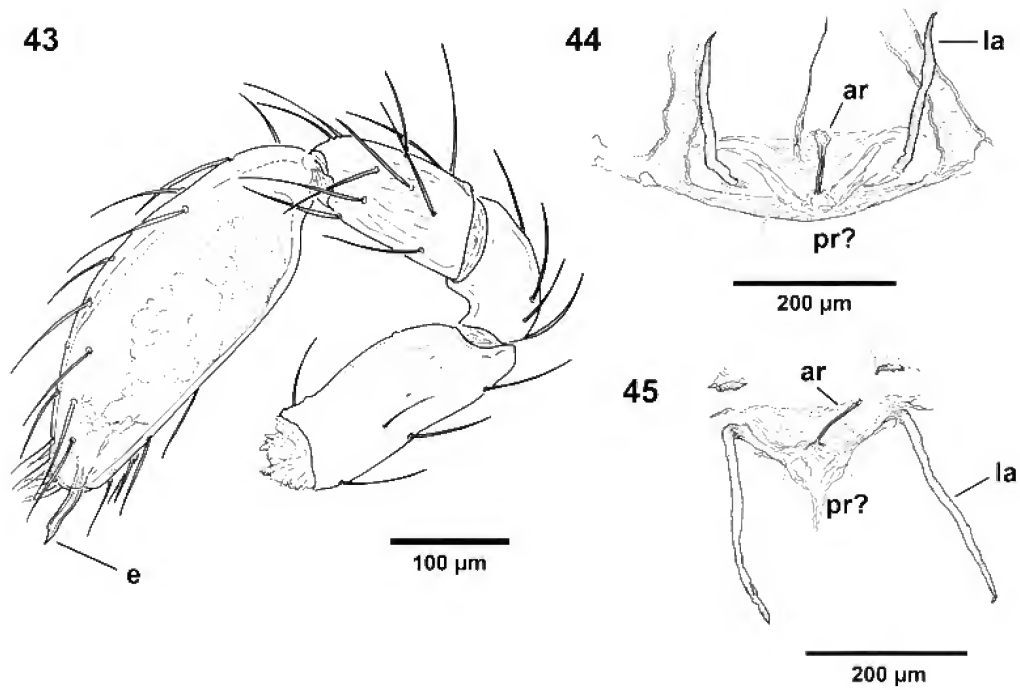


FIG. 36–42. *Aprusia veddah*, new species, female holotype (PBI_OON 15035). **36–38,** habitus (36, dorsal, 37, ventral, 38, lateral); **39–41,** cephalothorax (39, dorsal, 40, ventral, 41, anterior); **42,** epigastric area, ventral.

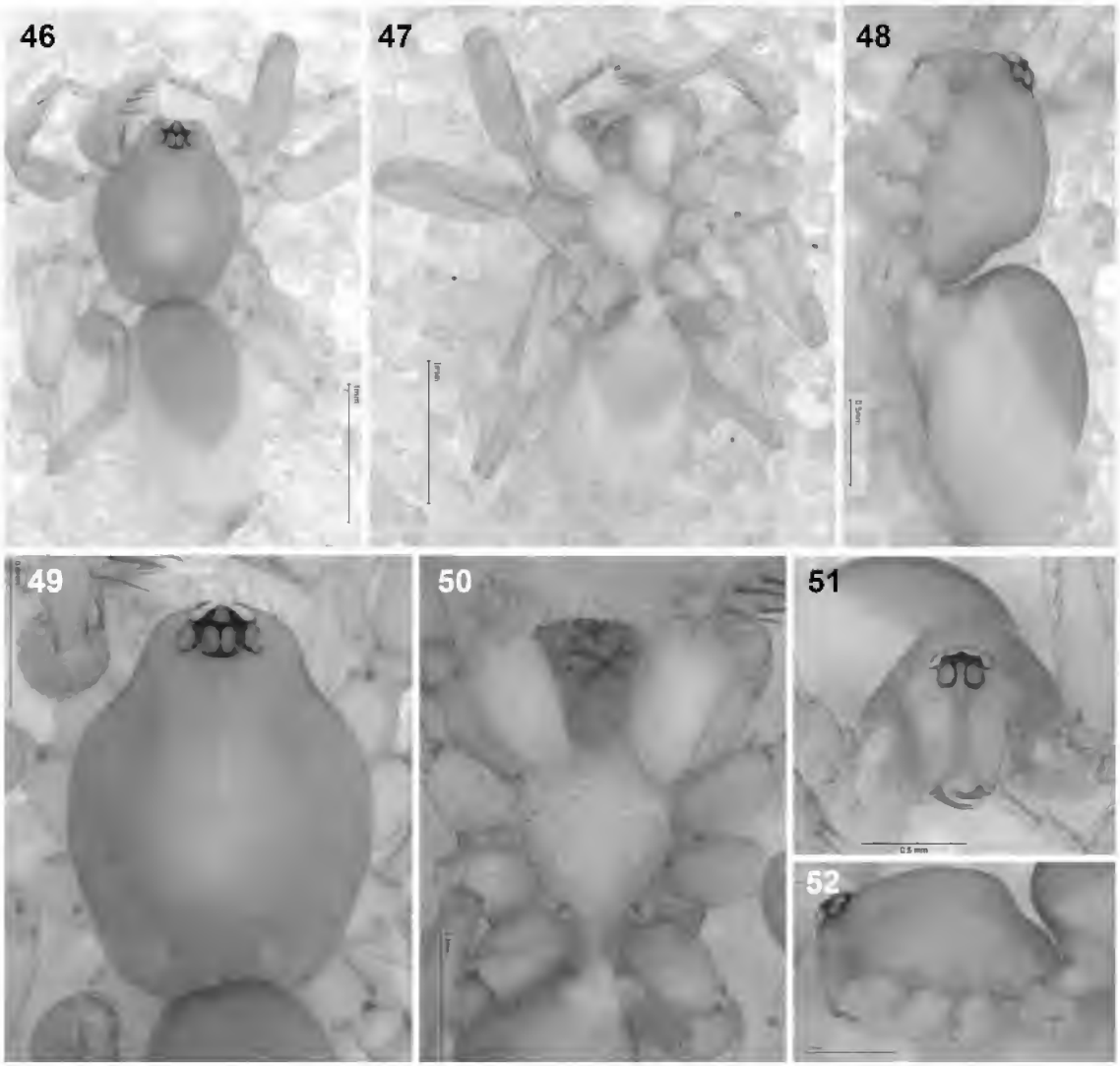
setae present, scattered; nonmarginal pars thoracica setae light, needlelike. Clypeus curved downward in front view (fig. 27); setae absent. Eyes all eyes circular; posterior eye row procurved from above; ALE separated by less than their radius, PLE-PME touching (figs. 25, 27). Sternum longer than wide, posterior margin not extending posteriorly of coxae IV. Mouthparts: Setae light; labium wide, with a procurved indentation; two subdistal normal setae. ABDOMEN: Dorsum soft portions white. Dorsal scutum covering about ½ of abdomen, not fused to epigastric scutum (figs. 22, 24). Postepigastric scutum short, almost rectangular (fig. 23). LEGS: White. Leg spination (only surfaces bearing spines listed, all spines longer than segment width): leg I: femur, pv0-0-1-1-1; rv0-0-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg



FIGS. 43–45. *Aprusia* spp. genitalia. **43–44,** *A. kataragama*, new species, male and female paratypes (PBI_OON 15034); **45,** *A. veddah*, new species female paratype (PBI_OON 15035). **43,** male, left palp retrolateral; **44–45,** vulvae, cleared, dorsal. Abbreviations: ar = anterior receptaculum, e = embolus, la = lateral apodeme, pr? = posterior receptaculum?

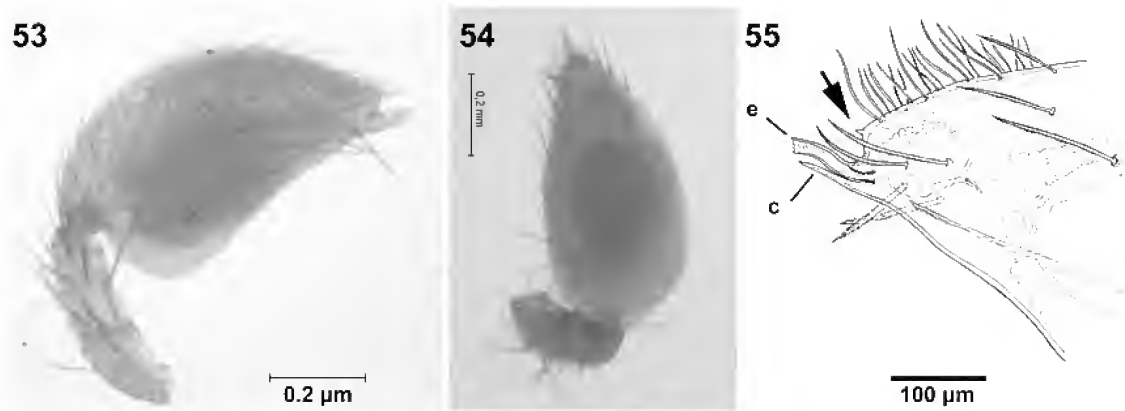
II: femur, pv0-0-1-1-1; rv0-0-0-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg III: patella, d2/1; tibia, d1-2; v1ap; leg IV: patella, d2; tibia, d1-2, v1ap. Tarsi I–IV superior claws tooth not examined in detail. Trichobothria not examined. GENITALIA: Epigastric region with sperm pore small, situated at level of anterior spiracles. Palp proximal segments white; embolus small, nearly straight; cymbium with distal patch of setae; bulb slender, elongated, more or less fusiform (fig. 43).

Female (paratype). Total length 2.20. As in male except as noted. CEPHALOTHORAX: Carapace yellowish white, broadly oval in dorsal view (fig. 32), with rounded posterolateral corners; lateral margin straight; nonmarginal pars cephalica setae present in one row; marginal setae absent. Eyes (figs. 32, 34): ALE largest; posterior eye row procurved from front; ALE-PLE separated by less than ALE radius, PME touching. Sternum yellowish white, lateral margins with narrow extensions between coxae; setae sparse, light, originating from surface. Mouthparts: Chelicerae, endites, and labium yellowish white. Chelicerae straight; promargin without teeth. Female palp claws absent. ABDOMEN: Book lung covers elliptical. Posterior spiracles connected by groove. Pedicel scutum extending far dorsal of pedicel. Dorsal scutum weakly sclerotized, relatively short, without color pattern, covering less than ½ of abdomen, between ¼ and ½ abdomen width, middle surface smooth, sides smooth, anterior half without project-



FIGS. 46–52. *Aprusia kerala*, new species, male holotype (PBI_OON 12360). **46–48,** habitus (46, dorsal, 47, ventral, 48, lateral); **49–52,** cephalothorax (49, dorsal, 50, ventral, 51, anterior, 52, lateral).

ing denticles, yellowish white (fig. 29). Epigastric scutum weakly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent. Postepigastric scutum weakly sclerotized, only around epigastric furrow, not fused to epigastric scutum, anterior margin unmodified, without posteriorly directed lateral apodemes, yellowish white (fig. 35). Colulus represented only by setae. LEGS: Patella plus tibia I near as long as carapace. Leg spination (only surfaces bearing spines listed, all spines longer than segment width): leg I: femur, pv0-0-1-1-1; rv0-0-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg II: femur, pv0-0-1-1-1; rv0-0-1-1; tibia, v2-2-2-2-2-0; metatarsus, v2-2-0; leg III: patella, d2; tibia: d2-2-1, v1ap; leg IV: patella, d2; tibia, d2-2-2; v1-2ap; metatarsus, d2-2; v1ap. Tarsi I–IV superior claws tooth not examined in detail. Trichobothria not examined. GENITALIA (figs. 35, 44): Ventral view:



FIGS. 53–55. *Aprusia kerala*, new species, male holotype (PBI_OON 12360), left palp. **53,** prolateral, **54,** ventral, **55,** detail of the distal part of the bulb. Abbreviations: c = conductor, e = embolus, arrow = conical projection.

posterior margin of epigastric fold with a procurved chitinized ridge. Field in front snow white. Lateral to this ridge, this species lacks the bracket-shaped sclerotized lines of *A. vestigator*. Dorsal view: Internal genitalia consists of a short anterior element, with a thin lumen and a slightly widened tip. In the only female examined there is no traces of posterior receptacle. Two short lateral apodemes that looks anteriorly directed in the preparation (fig. 44), although this is probably an artifact of the montage.

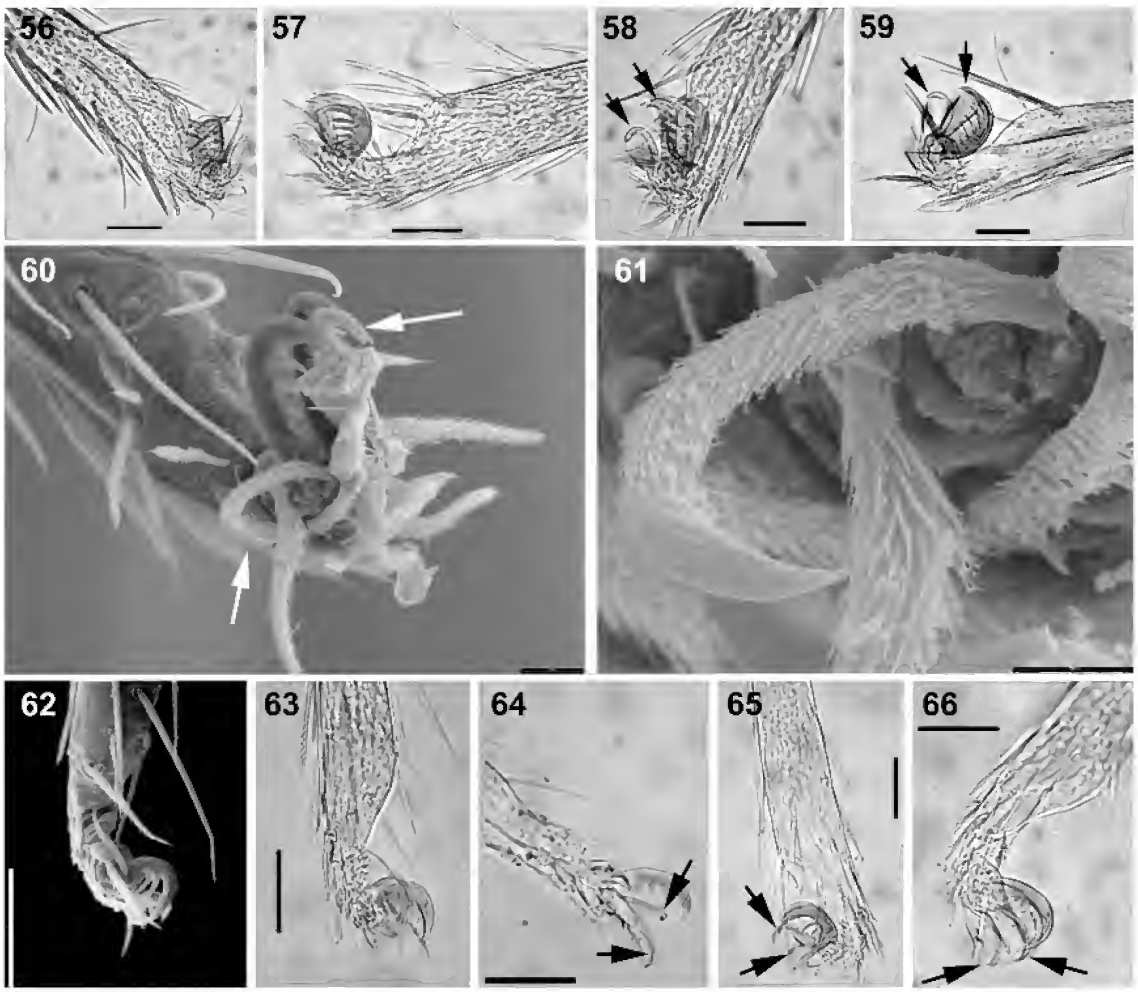
MATERIAL EXAMINED: Only the type series.

Aprusia veddah Grismado and Deeleman, new species
Figures 36–42, 45, 66, 67

TYPE MATERIAL: Female holotype and two female paratypes from Sri Lanka: Central Province: Kandy, ca. N 7°15′, E 80°43′, secondary forest, slightly damp litter, 600 m, 18 Aug. 1981, C.L. Deeleman and P.R. Deeleman (deposited in RMNH PBI_OON 15035).

ETYMOLOGY: The specific epithet refers to the Veddah people (also called Wanniyala-Aetto), indigenous inhabitants of Sri Lanka.

DIAGNOSIS: Females are very similar to those of *A. kataragama* in having the sternum longer than wide, by having only three spines on the prolateral side of the first femora, and by lacking the lateral bracket-shaped sclerotizations on the postepigastric scutum (figs. 42), but can be distinguished by having the abdominal dorsal scutum relatively long (fig. 36) and the anterior receptaculum and the lateral apodemes in the internal genitalia also relatively long and thin (fig. 45). The procurved ridge of the postepigastric scutum is narrower than in *A. kataragama* and have a thicker margin (fig. 42). *A. veddah* also differs from *A. kataragama* in having the paired clawlike setae on tarsi III and IV (fig. 66).



FIGS. 56–66. Morphology of the tarsi of *Aprusia* spp. **56–61,** *A. kerala,* male, **62,** *A. kataragama,* male; **63,** *A. kataragama,* female; **64,** *A. vestigator,* male; **65,** *A. vestigator,* female; **66,** *A. veddah,* female; 56 = tarsus I, 57 = II, 58, 65 = III, 59–63, 66 = IV. 61 = detail of the clawlike seta. Arrows = clawlike setae. Scale bars: 56–59, 62–66 = 0.05 mm; 60 = 20 μm; 61 = 10 μm.

Description: **Female** (PBI_OON 15035). Total length 1.83. CEPHALOTHORAX: Carapace pale orange, broadly oval in dorsal view (fig. 39), pars cephalica slightly elevated in lateral view (fig. 38), with rounded posterolateral corners, sides finely reticulate (fig. 41); lateral margin straight; nonmarginal pars cephalica setae present, scattered; nonmarginal pars thoracica setae absent; marginal setae absent. Clypeus curved downward in front view, vertical in lateral view. Eyes (figs. 39, 41): ALE largest, ALE circular, PME oval, PLE oval; posterior eye row procurved from front; ALE separated by less than their radius, ALE-PLE separated by less than ALE radius, PME touching, PLE-PME touching. Sternum longer than wide (fig. 40), pale orange, lateral margins with narrow extensions between coxae; setae

sparse, light, originating from surface. Mouthparts: Chelicerae, endites, and labium pale orange. Chelicerae straight; promargin without teeth. Labium wide, with a procurved indentation; two subdistal normal setae. Female palp claws absent; spines absent. ABDOMEN: Book lung covers elliptical. Posterior spiracles connected by groove. Pedicel scutum extending far dorsal of pedicel. Dorsal scutum weakly sclerotized, pale orange, without color pattern, covering about ½ of abdomen, more than ½ to most of abdomen width, not fused to epigastric scutum, middle surface smooth, sides smooth, anterior half without projecting denticles (fig. 36). Epigastric scutum weakly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent. Postepigastric scutum weakly sclerotized, pale orange, short, almost rectangular, only around epigastric furrow, not fused to epigastric scutum, anterior margin unmodified (fig. 42). Colulus represented only by setae. LEGS: Patella plus tibia I near as long as carapace. Leg spination (only surfaces bearing spines listed, all spines longer than segment width): leg I: femur, pv0-0-1-1-1; rv0-0-1-1; tibia, v2-2-2-2-0; metatarsus, v2-2-0; leg II: femur, pv0-0-1-1; rv0-0-1-1; tibia, v2-2-2-2-0; metatarsus, v2-2-0; leg III: tibia, d2-2; v1ap; metatarsus, d2-2; v1ap. Tarsi I–IV superior claws tooth not examined in detail. Trichobothria not examined. GENITALIA (figs. 42, 45): Shape: posterior margin of epigastric fold with a procurved chitinized ridge, strongly rebordered, with lateral internal reinforced sclerotizations. Field in front snow white. Lateral to this ridge, this species lacks the bracket-shaped sclerotized lines of *A. vestigator*. The internal genitalia consist of a short anterior element, proportionately thinner and longer than in *A. kataragama*, but smaller than of *A. vestigator*; it also has a thin lumen but not the widened tip. In the only female examined there are only traces of posterior receptacle. Two short lateral apodemes posteriorly directed, slightly longer than in *A. kataragama*.

Material examined: Only the type series.

Aprusia kerala Grismado and Deeleman, new species
Figures 46–61, 67

Type material: Male holotype and 1 male paratype from India: Kerala: Cardamom Hills, Muttapatti near Munnar, ca. N 9°52′, E 77°09′, 1700 m, Nov. 24, 1972, C. Besuchet and I. Löbl (deposited in MHNG, PBI_OON 12360).

Etymology: The specific epithet is a noun in apposition taken from the type locality.

Diagnosis: Males of *A. kerala* are easily distinguishable from the other species by their large size, their more strongly pigmented and sclerotized integuments and by having a small conductor together with the embolus (fig. 55).

Description: **Male** (PBI_OON 12360). Total length 2.8. CEPHALOTHORAX: Carapace pars cephalica strongly elevated in lateral view, sides finely reticulate (fig. 52), two shallow posterior thoracic depressions (fig. 49); nonmarginal pars cephalica setae present in one row; nonmarginal pars thoracica setae light, needlelike. Clypeus curved downward in front view; setae present, light, needlelike. All eyes oval; posterior eye row straight from above; ALE separated by their radius to diameter, PLE-PME separated by less than PME

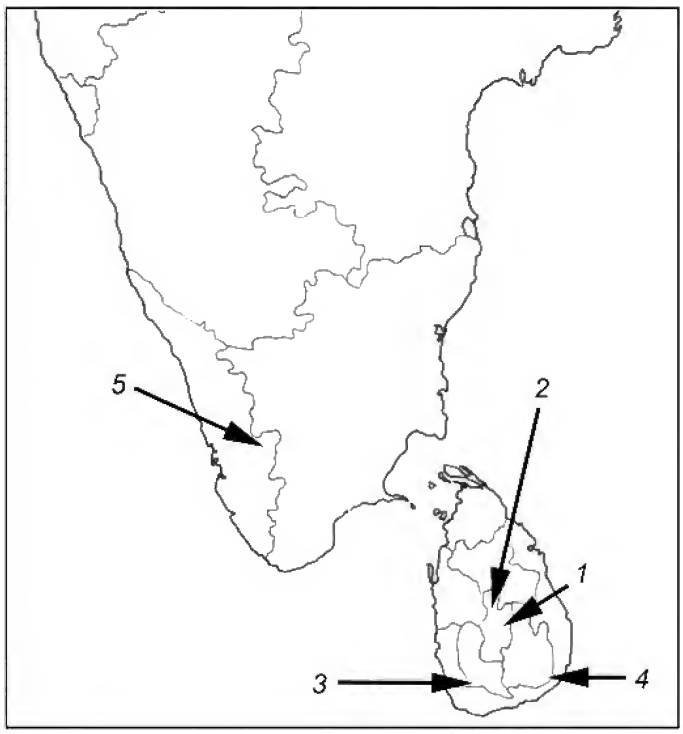


FIG. 67. Geographic distribution of *Aprusia* spp. Sri Lanka: **1,** Nuwara Eliya (*A. strenuus*); **2,** Kandy (*A. vestigator* and *A. veddah*); **3,** Sinharaja (*A. vestigator*); **4,** Kataragama Peak (*A. kataragama*). India: **5,** Cardamom Hills (*A. kerala*).

radius (figs. 49, 51). Sternum longer than wide (fig. 50). Mouthparts: Setae dark; labium wide, with a procurved indentation; two subdistal normal setae. Endites ummodified, relatively short, anteriorly directed, parallel. ABDOMEN: Dorsum soft portions white, three pale orange spots anterolateral to each ALS. Dorsal scutum covering ½ to ¾ of abdomen, fused to epigastric scutum (fig. 48). Postepigastric scutum short, almost rectangular (fig. 47). LEGS: Pale orange. Leg spination (only surfaces bearing spines listed, all spines longer than segment width): leg I: femur, pv0-0-1-1-1-0; rv0-0-1-0-1-0; tibia, v2-2-2-0; metatarsus, v2-2-0; leg II: tibia, v2-2-2-0; femur, vr1-0-0; metatarsus, v2-2-0; leg III: legs III missing; leg IV: tibia, v1-1-2; r0-0-1; metatarsus (dorsal), 1-2-1; (ventral), 0-1-0. Tarsi I–IV superior claws tooth not examined in detail. Trichobothria not examined. GENITALIA: Epigastric region with sperm pore large, situated between anterior and posterior spiracles. Palp (figs. 53–55) proximal segments pale orange; embolus short, gently sinuous, with an also short paraembolic process (conductor); cymbium without distal patch of setae; bulb stout, elongated, distal part with a tiny conical projection.

MATERIAL EXAMINED: Only the type series.

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